

ART. XXXII.—*On some supposed Pyritized Sponges
from Queensland.*

BY FREDERICK CHAPMAN, A.L.S.,

Palaeontologist to the National Museum, Melbourne.

(With Plate LXXXII.).

[Read 8th December, 1910].

Introduction.

The two specimens forming the subject of this note were purchased a few years ago for the National Museum collection from a Melbourne dealer, by whom they were regarded, not unnaturally, as "fossil fruits." It is fairly conclusive, however, from their shape and superficial characters, that they are pseudomorphs of typical Upper Cretaceous siliceous sponges. These pyritized fossils bore the rather vague locality label "Darling Downs, Q." They are, therefore, presumably from the Desert Sandstone formation (Upper Cretaceous), which is so extensively exposed in certain parts of Queensland. Another fossil specimen of very great interest accompanied the sponges in the same collection, which helps to corroborate the location of these fossils. It is a nearly perfect specimen of an internal cast of *Micraster*, which in all probability can be referred to the *M. sweeti* of Mr. Etheridge, junr., and which up to the present was represented only by an imperfect cast from the Desert Sandstone of Maryborough, Queensland.¹

The sole exposure of Desert Sandstone on the Darling Downs is in the Derby District, where an elongated outlier, averaging about ten miles across, extends in a south-easterly direction from Wambo, south of the Condamine River, to Mount Denville. Hence it is suggested that this is most likely the locality which yielded these fossil pseudomorphs.

1 Geol. and Pal. of Queensland and New Guinea, 1892, pp. 559, 560.

The pyritized (?) sponges now described resemble the Lithistid types of the characteristic Upper Cretaceous genus, *Siphonia*. The material which has replaced these sponges is now in the mineral form of marcasite. A radial structure in the interior is visible through the cracks which have developed in one of the specimens. On account of the complete crystalline replacement of the mass of the sponge, no spicular structure is preserved. As before stated, we have only the evidence of shape and superficial characters on which to base conclusions. No sponge remains appear to have been recorded from Australian Upper Cretaceous rocks; and the Lower Cretaceous has afforded only one genus, in the Hexactinellida, viz., *Purisiphonia*.

Description of the Specimens.

cf. Genus SIPHONIA (Parkinson), Goldfuss pars.

Specimen A. (Plate LXXXII., Figs. 1 *a, b.*)

This specimen is apple-shaped, or, perhaps, more accurately, melon-shaped. It is subspherical, but more elongated on the vertical axis; very tumid in the zone of the basal third; depressed and slightly tapering above the middle, where the surface is tumulose. Upper surface rounded, with a relatively small cloaca. Stalk inserted in a slightly depressed area. Lateral surface of the body with irregular, anastomosing or branching longitudinal grooves, giving the sponge the characteristic rugose appearance often present in *Siphonia*. (?) Vestiges of the fine incurrent openings may be seen on the surface of the cast, and more thickly disposed in the depressed parts.

Measurements.—Greatest length of body, 47.25 mm.

Greatest width of body, 45 mm.

Diameter of cloacal opening, circ. 4.5 mm.

Length of peduncle, 4.75 mm.

Width of peduncle at base, 8.75 mm.

Remarks on specimen A.—The form of this pseudomorph may be compared with that of the typical Cenomanian species, *Siphonia tulipa*, Zittel, which is so common in the Upper Greensand of Warminster and Blackdown, England. A critical comparison shows the Queensland fossil to be nearest the

example of the above species figured by G. Sowerby,¹ under the name of *Siphonia pyriformis* (non Goldfuss), and re-figured by Zittel.²

Specimen B. (Plate LXXXII., Figs. 2 *a*, *b*.)

In form this fossil is subcylindrical, slightly recurved, that is to say, concave and convex on opposite lateral faces respectively; bluntly rounded at the apex, with a conspicuous cloacal aperture, now filled with a projecting plug of pyrites, from which radiate a few irregular and obscure (?) excurrent canals. Distal end furnished with a short stout stalk, which, at the junction with the sponge body, is seated in a slight depression. Surface of sponge relieved with lobular swellings. In places the surface shows patches of especially verrucose character, which may be the vestiges of former areas of the incurrent system of canals. This structure is now, however, obscured by the development of crystal facets over the surface of those areas.

Measurements.—Greatest length of body, 45 mm.

Greatest diameter of body, 32 mm.

Diameter of cloacal opening, 5.75 mm.

Length of peduncle, 11 mm.

Width of peduncle, 7.25 mm.

Remarks on specimen B.—This example at first sight appeared to belong to the genus *Phymatella*, Zittel, on account of its subcylindrical form. The rounded summit and shape of the cloacal area, however, and the impressed peduncular seat exclude it from that genus. On the other hand, certain subcylindrical varieties of *Siphonia tulipa*, Zittel, show that our specimen is related to that specific type. Thus, a closely comparable form is that figured by Sollas,³ under the name of *S. pyriformis*, Sow., var. *cylindrica*, Courtillier. We here follow Dr. G. J. Hinde⁴ in placing Sowerby's species *pyriformis*, and also Prof. Sollas' so-referred species shown in his Figures 1, 3, 4, 6, 8 (*loc. cit.*) with Zittel's *S. tulipa*. We may therefore regard this Queensland fossil as probably referable to *S. tulipa*.

1 Geol. Trans., Series 2, vol. iv., 1836, p. 346, pl. xv., figs. 4 and 5.

2 Traite de Paléontologie (French ed.), 1883, vol. i., Paléozoologie, p. 169, fig. 80b.

3 Quart. Jour. Geol. Soc., vol. xxxiii., 1877, pl. xxv., fig. 4.

4 Cat. Foss. Sponges, Brit. Mus. (Nat. Hist.), 1883, p. 64.

Z. var. *cylindrica*, Court. The last-named author recorded his variety from the Cenomanian (Lower Chalk) of Saumur, Maine-et-Loire, France.³

It is worth noting, as further stratigraphical evidence of the homotaxy of the Desert Sandstone with the Upper Cretaceous elsewhere, that both *Siphonia tulipa* and its variety *cylindrica* occur in Europe in the latter series.

EXPLANATION OF PLATE LXXXII.

Fig. 1.—Pyritized sponge, cf. *Siphonia tulipa*, Zittel. *a*, Lateral aspect; *b*, apical aspect.

Fig. 2.—Ditto, cf. *S. tulipa*, Zittel, var. *cylindrica*, Courtyllier. *a*, lateral aspect; *b*, apical aspect.

Figures slightly less than natural size..

1 Courtyllier, A. "Eponges fossiles des sables du terrain Crétacé supérieur des environs de Saumur, étage Sénomien de D'Orbigny" (Extrait des Annales de la Société Linnéenne de Maine-et-Loire), 1861.